AUGUST 1968
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soil conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

SOILS AND WOODLANDS

Soil maps for planning
Wood products and jobs
Soil-site index studies

Public land laws

Rural beautification

SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE

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DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

COVER: When this country was settled, the forest growth was an indication of the potential of the soil for other crops. Mixed hardwoods—oaks, yellow poplar, walnut, and hickory—were first choice.

Focus on soils . . .

The Third North American Forest Soils Conference this month focuses the attention of the forestry profession on an important, and until lately largely ignored, sector of its concern.

Several months ago we asked SCS Head Forester C. T. "Cap" Prout to explore for our readers the significance of soils to woodland conservation and management.

The response of fieldmen to his query shows that the use of soil information for woodland planning has reached a high state of development in SCS.

The soil and woodland team of John Gorman and Ross Mellinger, for example, list many ways (p. 3) that West Virginia woodland owners rely on soil information.

Cap Prout's own account of soil-site index studies led by SCS (p. 7) establishes the scientific basis of the resulting technical guides.

Returns: The large economic benefits that stem from sound woodland management tailored to soil potentials are demonstrated in two contributed articles from Louisiana (p. 5) and Montana (p. 9).

Both make it plain also that agency cooperation is an essential element of such success stories.

Public land: Woodland owners and foresters, among others with a special interest in the relation of public lands to the private economy, will appreciate Ed Kerr's inside account (p. 15) of the work and plans of the Public Land Law Review Commission.

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A soil scientist-forester team takes tree measurements to determine site index for oaks and yellow poplar and records soil characteristics on Shelocta silt loam. At right, Moshannon silt loam, a deep, fertile, well-drained soil, was excellent for the black walnut, which is just 1½ years old. Soil maps are good guides to selecting the kind of tree to fit the soil.

Fitting the tree to the soil

West Virginia woodland owners find soil maps helpful in planning reforestation and answering management questions

By John L. Gorman and Ross H. Mellinger

Soil scientist and woodland conservationist, SCS, Morgantown, W. Va.

Private owners, both individual and corporate, own 91 percent of West Virginia's 11 million acres of forest land. The needs and objectives of the people who own and operate woodland are as varied as their tree crops and the soils on which they grow. For example:

A small Appalachian farmer wants to start a new woodlot on a steep, eroded pasture field. What tree species will heal erosion the quickest and produce a crop of wood while doing it? What soils on the farm are best suited for cash crops to bring in income while the trees are growing?

An owner of 5,000 acres of mountain forest land wants to go in for timber growing and recreation on his land. He wants to know what parts of his tract are best suited for each use.

A large wood-using industry acquires abandoned farmland for a tree farm. Which soils should be managed for hardwoods? Which for pines? How much of the land can be operated with large machines?

A logging contractor is going to bid on a timber job. Will the soils support his heavy equipment all year or will he be shut down part of the time when winter sets in?

An investor in timberland has a tract in mind. He wants to know the potential growth and yield for hardwoods under good management so he can estimate probable earnings on his investment.

Help in answering these questions and many more can now be had from soil surveys. The surveys, made by the Soil Conservation Service in cooperation with the West Virginia Agricultural Experiment Station, now cover over half of the Mountain State. On this land it is now possible to learn much about tree growth and forest-management problems from the soil maps and the interpretations that go with them. For tree farmers and foresters, they are like road maps showing the route to follow.

There are well over a hundred different soil series in West Virginia. Individual soils may be shallow, others may be deep. Some are sandy and loose, others are clayey

and sticky. Soils with similar properties are given the same name wherever they occur. They are commonly named after a county or town where the soil was first mapped or described, such as Wheeling, Huntington, or Lindside.

Soil classification

Since soils are classified and correlated within a nationwide system, information obtained in one place is applicable in another county or state within the same climatic area on the same soil. This makes it possible to exchange and use data over a wide area.

In West Virginia, SCS uses a soil scientist-forester team to relate tree growth to kinds of soils. Site index, a gage for potential yields, is measured and recorded for common indicator crop trees (like oaks) growing on named kinds of soils.

The soils are examined and described. Features such as associated tree and shrub species, aspect, slope, elevation, and ground cover are recorded and used to help develop other soil-related forestry information. These data furnish a basis on which such things as species suitability, erosion hazard, equipment limitations, competition from undesirable plants, seedling mortality, and windthrow hazard can be predicted for each kind of soil.

SCS soil scientist-forester teams analyze the tree measurements and soil properties. They find that certain soils grow trees quickly while others grow trees very slowly; that certain tree species commonly occur on some soils and not on others. They also discover that there are wide differences in woodland-management hazards, such as danger of erosion and limitations on the use of equipment. These differences are described by rating soils as having slight, moderate, or severe limitations for each item considered. By comparing these ratings, they find which soils have about the same effects on tree growth and woodland operations. Soils similar in their effects on tree growth and management are placed together in "woodland suitability groups."

Technical guides

This information is incorporated into SCS technical guides and published soil surveys. This allows soil maps to be interpreted for woodland owners who want to know more about the suitability of their soils for tree farming.

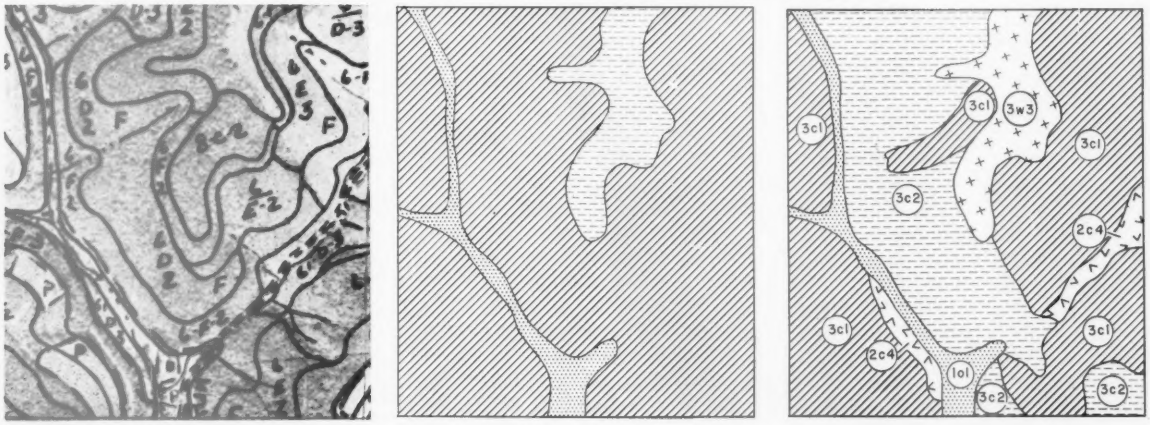
Woodland interpretations can take several different forms. The most commonly used one shows soils combined into areas of similar woodland suitability. These areas are made up of soils which have similar effects on species suitability, tree growth, and management. A legend for such a map would briefly explain the following items for each area: Potential productivity for the commercial tree crops common to the soils; tree species preferred for managing in natural stands or for planting; and all of the soil-related hazards and limitations that are locally important.

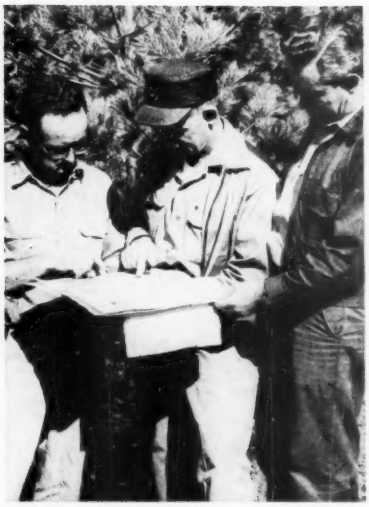
Another kind of interpretation shows a specific management hazard or limitation, such as restrictions in the use of woods equipment. This kind of interpretation can be shown graphically as a colored overlay of the map. A legend explains the map in terms of colors which denote slight, moderate, or severe limitation.

Other specific soil map interpretations important in woodland management are those for woodland site quality, species suitability, plant competition, and erosion hazard. Interpretations are selected to meet the specific needs of the woodland owner or forester.

Foresters who are concerned with

Left, the basic soil map delineates areas of each kind of soil. The figures and letters comprise symbols that record the kind of soil, steepness of slope, and degree of erosion in each area. A single-factor interpretive map shows the limitations of each soil for a particular feature; in this case, hazard to use of equipment: dotted hatchure, slight; horizontal, moderate; oblique, severe. Right, another interpretive map shows areas of similar woodland suitability. The first number of the three-part symbol in a nationwide system indicates productivity; the small letter tells the main soil property that causes problems; and the third number identifies the woodland suitability group.





A landowner (left) in the Upper Ohio Soil Conservation District, Neil Aberegg, studies the soil map of his land with Soil Conservationist Noel Cochran and County Forester Frank Vance.

managing large tracts of land find soil maps to be useful tools in developing management plans. The maps help them decide on the most promising commercial species to manage on each soil.

Conservationists and foresters can make preliminary judgments on the feasibility of planned cultural work needed to improve growth or quality of tree stands. They can predict frequency of thinnings and intermediate cuttings (cutting cycles). They can determine the most economical crop tree size to grow on each kind of soil. They can decide on the kinds of equipment needed in cultural and harvesting work and where to build roads for skidding and hauling.

Soil maps have become a valuable part of the professional forester's "kit of tools." One of them said recently, "Look down at the soil, not up at the trees if you really want to tree farm." ♦

Paper company puts soil information to work to grow trees and keep people in jobs

By H. Ford Fallin and Lester L. Loftin

Woodland conservationist and assistant state soil scientist, SCS, Alexandria, La.

The use of soil surveys in managing timberland helps to grow trees that keep 800 people working in the Calcasieu Paper Company plant at Elizabeth, La.

Payrolls amount to more than $5 million each year. In addition, income is provided to about 400 people who cut and haul pulpwood to the plant.

Paul W. Wright, who manages Calcasieu's Wood and Land Department, says that the paper company spends more than $3 million a year for timber, timberland leases, and forest developments.

The company's 75,000 acres in southwest Louisiana is under conservation agreement with the Calcasieu Soil and Water Conservation District. The first agreement on a 7,000-acre tract was signed in 1958. Between 1961 and 1967 an additional 64,340 acres of leased land was added to the agreement.

Soil survey information was used in developing management plans for the entire area and in acquiring new timber-growing lands.

Management of the timberland is started by dividing it into 160-acre compartments, each to be handled as an even-aged unit. Soil Conservation Service people in Oberlin and DeRidder helped to interpret soil surveys which are used for guidance in the long-range woodland conservation plans.

"The main objective of our company is to grow timber for our mill," Wright explains. "We are using the even-age management system to give us uniform sized trees that will permit a high degree of mechanization in harvest.

Manager of Wood and Land Department of the paper company, Paul W. Wright (right), examines soil sample dug by SCS Soil Scientist Lester L. Loftin.

"Our plans call for an orderly harvest of existing timber, cutting the poorest compartments first. These clear-cut compartments are then promptly reforested. One or two thinnings will be made between 15 and 25 years of age. A final harvest cut is planned at 30 to 35 years.

"A soil survey is valuable to our company in many ways. One is that it shows how fast trees can be grown. This governs the amount we can afford to spend when acquiring and developing land. Further, it indicates the most suitable kind of trees and influences the method of reforestation we select."

Other uses of surveys are to determine the size and location of areas needing drainage and to show the degree of equipment restrictions during planting, crop tending, and logging operations.

Wright points out that the soil determines the species of trees they choose to plant or manage for an area: Creek bottom sites are best suited for loblolly pine and hardwoods; poorly drained upland sites for slash pine. Well-drained uplands are suited for both loblolly and longleaf pine, he said.

Wright recalled that in one of their early operations he used the soil survey to locate 3,500 acres of high-quality land along Ten Mile Creek. The area was clear cut and promptly direct-seeded to loblolly and slash pines. Competing brush was controlled with chemicals applied by mist blower and injectors. This was a new technique that gave a full stand on about 70 percent of the area at low cost. He added that knowledge of the soils and good timing contributed to the success of this technique.

Manager Wright (right) considers some points in the conservation plan with SCS Work Unit Conservationist Jack R. Cutshall. To the left of the firebreak in the background is a 6-year old slash pine plantation.

On another tract, the soil survey outlined 20 acres of high site potential but was subject to seasonal flooding. A drainage ditch, costing about $200, was constructed to drain off the surface water. The area reseeded naturally and is now fully stocked with loblolly pine. This good land, with a high site potential, capable of producing two cords of pulpwood per acre per year, was reclaimed for a cost of $10 an acre.

Wright said, "We are working out grazing leases with local cattlemen. Grazing is a secondary land use for us. It helps to pay taxes, reduces the fire hazard, and provides additional income to the local community. We are also interested in developing hunting and recreation uses."

The Calcasieu Paper Company has been in operation at Elizabeth since 1926. The mill is operated 7 days a week and uses 500 cords of wood a day. Only 20 percent of the mill's wood supply comes from company land. The six foresters in Calcasieu's Wood and Land Department are using every means available to develop a permanent pulpwood supply for its mill and to help the economy of the area by establishing full stands of desirable trees as rapidly as possible.

Soil "know-how" is helping do it. ♦

Pulpwood being unloaded at the Calcasieu paper mill.

Woodland site index ratings of soils

By Carrow T. Prout, Jr.
Head forester, SCS

Using plants, including trees, as indicators of soil productivity and quality is not new. Man has probably associated natural vegetation and soil potential since the dawn of civilization.

When this country was first settled, the forest growth provided an indication of the potential of the soil for other crops. In 1842, Edmund Ruffin, editor and proprietor of the *Farmers Register* in Petersburg, Va., told his readers what to look for in selecting land to farm:

"In conclusion, we would say, if land in the interior is wished, make poplar and walnut the first trees to be sought for. If you cannot get land with these—look for ash-magnolia-sassafras of large size—beech or large sized white oaks. As a third choice take land with large red oaks and hickories.

" . . . and leave as the last chance such spots as grow no other tree (pine), particularly if they are small."

The search for a better knowledge of soils began long ago; it continues today. Late in the past century scientists began classifying soils, naming and describing them in terms of their characteristics and genesis. Then the art of mapping soils—showing their extent and location on a map—was developed. Interpretations then could be made showing the suitability of named soils for growing trees, cultivating crops, and many other uses.

One of the early kinds of interpretations was a system of classifying soils according to use capability described in USDA Miscellaneous Publication 352, *Soil Conservation Survey Handbook,* by E. A. Norton, in 1939. Later, in 1961, *Land Capability Classification,* USDA Agriculture Handbook 210, by A. A. Klingebiel and P. H. Montgomery, documented an improved version that is still used by SCS.

The land-capability classification was developed mainly to simplify detailed soil information for use with common cultivated crops and as a tool for broad general land use planning. Some conservationists at first viewed it as a universal tool, a panacea, for simplifying detailed soil information for many uses. Arguments were many—that class I land was the best forest soil, class VII the worst, and the like. And there were those who thought otherwise.

Soil-site index correlations began because of such discussions. Studies relating soils and tree growth were begun in the Pacific Northwest in 1945 under the leadership of Theodore B. Plair, then regional forester there for the Soil Conservation Service. The results firmly established that there is a definite relationship between the kind of soil as mapped by the soil scientist and the growth of trees.

Plair moved to the Southeastern region of SCS in 1953. There with Dr. T. S. Coile of Duke University, who had done much research in forest soils, as a consultant, he initiated similar studies of the correlation of soils and site quality.

About the same time, Dr. Earl L. Stone, Jr., of Cornell University, assisted in organizing SCS efforts in the Northeast, working with A. C. McIntyre, SCS regional woodland conservationist.

When Plair came to Washington in 1954 as head woodland conservationist for SCS, he worked closely with soil scientists to unify the soil-woodland correlations in the Nation. Dr. Paul E. Lemmon gave leadership in the Soil Survey Interpretations Division in developing and coordinating the national system.

Soil-woodland correlation studies seek to determine the average site index for each important species of tree on major soil series. For example, loblolly pine is a common tree on the Norfolk series in the Coastal Plain from Virginia to Mississippi. It is now known that wherever loblolly pine grows on Norfolk fine sandy loam it has a site index of about 80. This figure expresses the correlation that exists between Norfolk soil and the site index of loblolly pine.

Site index is a measure of the potential growth of a tree species on a specific site, expressed as height at a given age. The height growth of trees is regular and predictable and is not affected by available growing space except in overcrowded or very open stands. In normal stands the height of a tree, at any known age, is a reliable indication of the ability of trees to grow on the site.

Furthermore, research has provided detailed information relating site index at different ages to volume units of growth and yield for specified kinds of forests growing under described conditions. Average site index of a soil for a specified tree then becomes a quantitative prediction of productivity.

In the United States east of the Rockies the height of a tree at 50 years of age is most commonly used as the site index. In the Rocky Mountains and west the height at age 100 is used for most species.

To correlate soils and site index for the many kinds of soil and many species of trees across the Nation is an enormous job. A study of this kind requires uniformity and

teamwork. Foresters and soil scientists must work together.

The plots, or places for making the measurements, must be carefully selected. Each soil must be typical of its kind, "modal" or within the central concept of the range of characteristics as defined for that soil. The trees must be of the desired species, they should be "middle age," neither too young nor too old, and must have been free of any growth retarding or damaging influence during their life. The trees must have been in either a dominant or codominant position throughout the life of the stand.

Measurements are made carefully. Pits are dug so that the soil features are visible and can be examined, measured, and recorded. The ages and heights of the trees are carefully determined with instruments designed for these purposes. All measurements are recorded.

At least five plots are selected and measured for each tree species or forest type being studied on each kind of soil. As the work progresses, the plot data are summarized and analyzed. Tests of reliability are made. If the standard error is more than considered desirable, more plots usually are selected and measured to determine the cause of variation. When observations for a specific soil continue to give a wide range of site quality, it may be necessary to examine the soil more closely. In some instances a new series or soil phase has been set up to give the needed reliability to the correlations and to make the soil map more meaningful for woodland use.

To date, within the United States, soil-site index measurements have been made on more than 22,000 plots. This involves approximately 2,900 different kinds of soil, 24 species of trees or forest types, and measurements of more than 77,000 trees.

Federal and state agencies and colleges and universities for many years have been studying the effect of different soil characteristics on growth of trees. Such factors as the depth of the soil, available water capacity, texture, organic matter, chemical composition, and many others have been studied individually and collectively.

These have been helpful in understanding the relative importance of major soil characteristics. But these factors do not affect tree growth independently of each other. Their combined effects in soils that are identified and named on the soil map are a better basis for soil-site index correlations.

The Soil Conservation Service has followed the latter approach. And it has worked in cooperation with other Federal and state agencies, universities, and forest industries. In many states, SCS describes the soils while foresters of the state forestry agency or of forest industries obtain the tree measurements and vegetative information.

As this vital work continues, as the volume of data increases, and as the demand for the information grows, manual summarization, analysis, and interpretation become more and more difficult. So SCS is turning to the computer for electronic storage and retrieval of all correlated soil-woodland interpretative data.

As these measurements are made and correlated with kinds of soil, the results are published and made available for foresters and land managers who need and use such information. The first progress reports were issued in 1959 on "Soil Survey Interpretations for Woodland Conservation—Forested Coastal Plains, Arkansas" and ". . . Western Louisiana." Recent soil surveys of areas where woodland is important have sections devoted to the woodland interpretations. Also, current information is available in SCS technical guides for the use of SCS personnel in advising land owners and operators about the potentials of their land for growing adapted trees. ◆

Community effort solves playground problem

"The best cover of grass I've ever seen on a school yard," recently remarked Irwin S. Maddy, superintendent of Summers County, W. Va., schools.

Results of cooperative community efforts involving the Lilly Heights Parent Teachers Association, Summers County Board of Education, and the Soil Conservation Service, precipitated the comment.

The project began when the Board of Education, a cooperator with the Southern Soil Conservation District, wanted grass to grow on the barren playground at the grade school. For many years, children came home either dusty or muddy, causing parents to voice concern about the condition of the grounds.

The board planned to supply the seed, lime, and fertilizer; members of the local PTA, the labor and machinery including the tractors, plows, disks, rakes, and shovels; SCS the technical assistance, with work to begin at once; and the soil treatment material and Kentucky 31 fescue to be purchased from a local feed dealer. A planned diversion would intercept the surface runoff.

On a morning in May the work began. The diversion was shaped while a seed bed was disked from the hard soil. Workers raked off stones and leveled rough spots. By evening the job was complete.

In spite of one of the driest of summers, September saw a beautiful lush stand of fescue.

The result, children's clothes and shoes are staying clean, thanks to a community that plans and works together.—ROBERT A. SPEICH, *work unit conservationist, SCS, Hinton, W. Va.* ◆

Montana forests respond to agency teamwork

By Charles E. Wright and George H. Gable

Office of state forester, Missoula, and woodland conservationist, SCS, Bozeman, Mont.

Since 1961, a sawmill in western Montana has paid some 60 to 70 local soil conservation district cooperators more than $1 million, most of it for small timber with no previous market. At the same time, the company has employed 20 to 30 local part-time farmers to operate the mill.

The wood products industry is one of many benefits coming out of woodland conservation improvements performed by cooperators in the Green Mountain Soil and Water Conservation District. The improved economy is felt in all parts of the county.

The growth and success of this woodland project was, in no small measure, due to the excellent working relations between cooperating agencies and the district. The Soil Conservation Service and the Montana Office of State Forester each provided one member of the woodland planning team. Both men are headquartered at the Soil Conservation Service office in Plains. They work together, share equipment and tools, and provide timely and efficient service to the cooperators.

The result is a marked increase in people who request and receive help in thinning young woodland stands and in proper harvesting and slash disposal of mature stands. Reforestation has gained more attention, and the trees respond quickly to good growing conditions under woodland management.

In 1961 the district helped Durable Wood Products Company build the sawmill at Trout Creek. Cooperators were encouraged to harvest and market their stagnated stands of lodgepole pine, western larch, and Douglas fir.

Donald G. Naegeli, chairman of the district board of supervisors, calls this the "first phase" of their woodland improvement program.

All this started when the district supervisors consulted with A. B. Linford, SCS state conservationist, and Gareth C. Moon, Montana state forester, on ways to improve woodland assistance. As a result, Linford and Moon agreed on working relationships and how cooperation could best be achieved.

Members of the woodland planning team compare work schedules to assure efficient use of time and travel. They agree on joint use of technical guides, procedures, and working tools. Both foresters promote the district's entire program on all fronts as they go about their work. They work as a team, whether together or alone, and the cooperators receive one conservation plan that combines the wood-

Above, Craig Roberts (left), service forester for Montana office of state forester, and Gary Gebhart, SCS aid, cruise and mark timber for the owner according to a woodland management plan. At right, Cary Hull (left), SCS woodland conservationist, and Craig Roberts (right) help Don Naegeli scale logs on his farm.

land management features with all other decisions on use and treatment of their land.

The district is now engaged in "phase two" of their woodland effort to meet recent changes in woodland use. Newcomers to the area are buying small woodland tracts; some for speculation, some for recreation developments, and others just to own and retire on a handsome piece of land covered with a growing forest.

To fulfill the district's obligation to these people, the supervisors have asked the State Extension Service to help them develop a door-to-door canvass of the woodland owners. They hope to interest the new owners in their woodlands and determine the kind and amount of assistance the people want and need. The people are being asked for their ideas and proposals to promote farm forestry activities. When the results are summarized, the district will be still better able to make full use of the woodland assistance provided by the two cooperating agencies. ◆

Fire suppression lanes are more than firebreaks

Firebreaks in the Central Spokane Soil and Water Conservation District, Wash., are being built as fire suppression lanes.

They are laid out and constructed so they can be used as roads to get fire equipment into any area of the woodland and are the basis for ACP cost-share payments.

In 1966, 2½ miles were built; in 1967, 4 miles; and for 1968, 15 miles of lanes are planned.

With technical help from the SCS, District Cooperator Walter Scott constructed 7,300 feet of fire suppression lanes in 1967 on his 90 acres of woodland.

Aerial photographs helped Scott and the soil conservationist decide where the lanes should be built. They ran the proposed route of the lane with a hand level, compass, and 100-foot chain; used color flagging to mark the route for the equipment operator, and recorded, plotted, and marked direction and distance in Scott's conservation plan folder.

To make all the woodland accessible to fire-fighting equipment, they found that lanes were needed on slopes of up to 40 percent. As the route was laid out, they avoided steep grades, put in a few short steep pitches where topography required it, constructed water bars to prevent the land from eroding, and sloped roads to the downhill side to prevent building up a large head of water that would cause serious erosion. They kept to a grade of 6 percent or less where possible to cut construction and maintenance costs. The width of the firebreaks was 10 to 12 feet.

Construction of the firebreak was done by a local contractor at a cost of $0.03 to $0.05 a foot, depending on the type of soil and the quantity and size of trees to be removed. A good operator, using a crawler-type tractor with a 12-foot angle blade, can complete 300 to 400 feet of fire lane an hour.

Already the new fire suppression lanes are being used for more than access in case of fire. They make for better management, since other woodland practices, such as thinning and pruning, are now feasible. Small saw logs have been taken out in a small timber sale. The woods can now be used for the enjoyment of Walter Scott's children and grandchildren. He plans to build a pond to add more value to his woodland.—GARY R. NORDSTROM, *forester, SCS, Spokane, Wash.* ◆

Conservation district sets up woodland contractor

The Pope County Soil and Water Conservation District in west central Arkansas now has a contractor doing timber stand improvement work that is helping meet a conservation need and providing full-time employment for the operator and two helpers.

Noting that the Conservation Needs Inventory showed several thousand acres of woodland in the district needing timber stand improvement, the district supervisors talked to several prospective contractors. They located a young man, Leroy Phillips, who had been working in timber for several years and seemed suited for this work.

The supervisors offered to sell Phillips tree injectors and herbicide on credit and to write letters to woodland cooperators telling of his services. They also arranged for news articles to promote timber stand improvement.

Local SCS conservationists gave Phillips technical instruction.

The supervisors urged him to apply to the ASCS office for recognition as a vendor, so cooperators could have work done with a small outlay of cash.

Soon Phillips realized he needed better transportation. He was advised to see County Supervisor A. D. Robins, who assisted him in securing an economic opportunity loan from Farmers Home Administration to buy a new pickup truck.

Leroy Phillips has been so successful that he has repaid the Pope County District for the injectors and herbicide, and results of the district's efforts are evident in 1,200 acres of woodland where he has done timber stand improvement.—FRED J. WILLIAMS, *woodland conservationist, SCS, Russellville, Ark.* ◆

Delno Cooney inspects his 8-year-old, 5-row windbreak of white pine and Norway spruce.

Trees against the wind in Ohio reverse pioneer trend of forest clearing

The landscape of Hardin County, Ohio, is typical of that found over most of the northwest quarter of the state. The relief is flat, tree cover is sparse, one can see for miles, and the winter winds swoop low across the naked fields.

This is farm country!

In the beginning, Hardin County, like most of Ohio, was covered with forest. The early settlers, who began to arrive soon after 1800, found the heavy timber an obstacle to their survival. Clearings were needed to produce vital food crops. By midcentury the deforestation process was well advanced.

Today there is evidence in Hardin County of a reversal of this trend. Cooperators with the Hardin County Soil Conservation District and other landowners are now planting more and cutting less, around the farm buildings at least.

A sturdy 110-year-old planting of eastern redcedar now protects the Hubert Slessman farmhouse from the prevailing south and west winds. We can only conjecture what might have motivated the owner of this farm in 1858 to make this planting. We can wonder why these trees were planted in a fashion so similar to the way we design windbreak plantings today.

By the 1880's and 1890's tree planting activity around Hardin County farmsteads was on the rise. Plantings of 70- to 90-year-old Norway spruce are much in evidence today in the county and throughout northwest Ohio. Also in this area we find Scotch pine, eastern redcedar, and catalpa, all of about the same age as the spruce.

Farmstead tree plantings in this area continued, but on a limited basis, into the present century. In the mid-thirties the conservation movement rekindled an interest in tree planting, both of forests and windbreaks.

Typical of many such plantings, the Jeanette B. Davis windbreak has seven rows of Norway spruce. This is more rows than now considered necessary but the trees are vigorous and give excellent protection to her 2-acre farmstead, about a mile north of Ada.

The Charles Smith farmstead, 3 miles north of Kenton, has been protected for years by a three-sided Norway spruce windbreak planted in 1938. Mr. Smith admits that his windbreak came about by happy accident; he had intended to raise Christmas trees, but they "got away from him." Now he wouldn't trade for a whole field of Christmas trees. Smith claims that his winter fuel bills have been reduced an equivalent of about $50 a season.

In 1954 John Deal planted a three-row windbreak, 300 feet long, along the westward side of his farm home. The planting consists of Norway spruce, white pine, and red pine on a Morley series soil. The location is about 7 miles southwest of Kenton. The white pine in this instance is the tallest, having grown 18 feet in 14 growing seasons.

A younger windbreak is that of Delno Cooney, 8 miles west of Kenton, and planted in 1960. Mr. Cooney planted five rows of white pine, and, to leeward, one row of Norway spruce.

Harold Ault has a vigorous 4-year-old windbreak planting at his farm home 5 miles west of Kenton. Individual rows of Austrian pine, white pine, and Norway spruce are spaced at 10 feet apart. Trees are spaced every 10 feet in the rows with temporary "filler" seedlings placed half way between the permanent ones.

Landowners of all northwest Ohio counties who contemplate windbreak plantings are being encouraged to follow the guidelines for windbreak design developed by the Forest Service, Soil Conservation Service, the Ohio Agricultural Research and Development Center, Ohio Division of Forestry and Reclamation, and others.

Cost-sharing of up to 80 percent of the cost of fencing, seedling purchase, and planting has been a part of the ACP Program in northwest Ohio since 1966.

Ohio farmers have found that if a row of shrubs is added next to the windbreak trees, wildlife is benefited, beauty is enhanced, and the farm house becomes a happier home.—LEROY BOGER, *work unit conservationist, SCS, Kenton, Ohio.* ◆

A group of 4-H Club girls paint mailbox supports as their contribution to the Menominee rural beautification program. A group of 25 mailboxes on a 4-mile stretch of road got the treatment.

Action for beauty

By Allen C. Weber
Work unit conservationist, SCS, Stephenson, Mich.

A landscape becomes beautiful when people care enough to do enough.

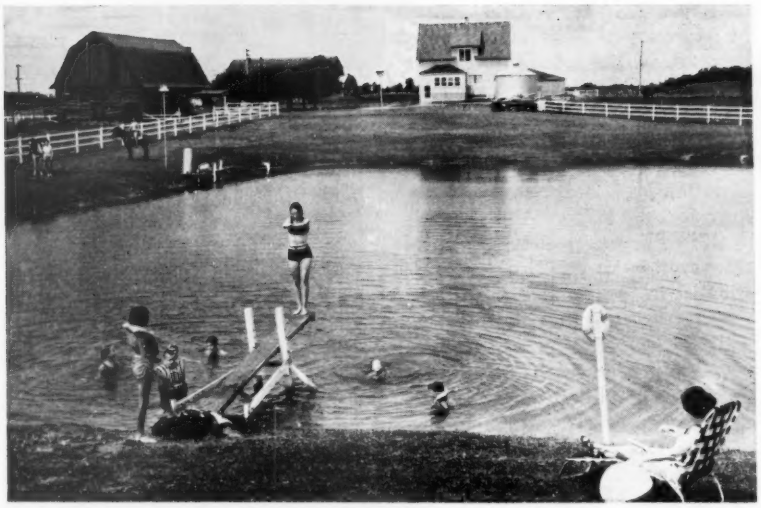
This simple truth has inspired a rural beautification program in Menominee County Soil Conservation District, Mich., that is attracting nationwide attention.

It began with a meeting in the spring of 1965 when Menominee County District directors and several other interested persons discussed how they could respond to Lyndon B. Johnson's challenge to "preserve and improve the natural beauty in America."

It was noted that eye-pleasing effects had been showing up wherever soil conservation practices

Below, dairy cows and stripcropping system on the Albert Delleis farm add beauty to the countryside. At center, a multiple-purpose farm pond provides water recreation for the family as well as irrigation for the garden and drinking water for livestock. The pond area has been attractively fenced and landscaped.

Michigan district adds extra touches to community's rural charm



A spring-fed pond on the Ray Linsmeier farm provides neighborhood recreation in well-kept surroundings.

were applied ever since the conservation district was established in 1944.

Thousands of acres of stripcropping on the glacier-formed drumlins provided interesting patterns on the rural landscape; tree planting had changed previously bare hillsides along the highways to scenic evergreen plantations; and waterfowl visited well landscaped farm ponds.

Soil conservation practices, intended for erosion control and good land use, had beautification as a byproduct. Someone labeled it a "fringe benefit."

This "fringe benefit" type of beautification was evident in many parts of the district, but not everywhere. Much more needed to be done, especially along main highways traveled by thousands of tourists.

During the first summer there was much discussion and planning and also some visible signs that the program was effective.

The following spring, renewed emphasis and publicity resulted in individual, group, and community action. The county 4-H Club met with conservation district directors in a planning session, and the 4-H Clubs geared their program to landscape planning that included projects like painting all mail boxes and mailbox supports along a 4-mile stretch of county road.

The Gourley Township community group set aside 1 day to clean up yards and pick up litter along the road. Gourley Township had no garbage dump; the township supervisor was contacted about establishing one. This has now been done, and residents are urged to dispose of all unsightly litter there.

The Menominee County Farm Bureau gave public endorsement to the district's rural beautification program and urged members to cooperate.

The family judged to have contributed most to rural beautifica-

Three 4-H Club girls pause to admire the colorful crownvetch in bloom in a roadside erosion-control planting.

tion was honored by the Menominee County District at an awards banquet in the fall of 1966, when Mr. and Mrs. Anthony Jasper of Carney received an engraved pen set. The same family expanded its efforts to communitywide beautification in 1967 and received another award.

In its third year now, rural beautification is an important part of the district program. Directors plan a continued application of needed soil conservation practices, farmstead improvement, and emphasis on planting for esthetic as well as utility purposes.

The Soil Conservation Service plant materials center furnished Emerald crownvetch seed for trial in stabilizing difficult areas. Crownvetch had been tried earlier on a very small scale and seemed to have good possibilities.

A leveled borrow pit and several steep road cuts, all in the same vicinity, were seeded. The Menominee County Road Commission and landowners in the vicinity cooperated. District and SCS personnel did the planting.

There was a definite increase in numbers of farmstead and field windbreaks planted this year. Packages of mixed shrubs and trees to improve wildlife habitat were planted in odd areas.

Mr. and Mrs. Anthony Jasper, winners of the Menominee rural beautification contest, are congratulated by Lester Walcutt, 4-H Club leader.

County 4-H Clubs received a donation from the Sears Roebuck Foundation for landscape improvement. The money is being used to propagate shrubs and other plants for beautification purposes plus their use for erosion control and improvement of wildlife habitat. The planting program is due for expansion next year.

The beautification efforts drew the attention of two neighboring conservation districts last fall when local directors were hosts to directors and their wives from Iron and Dickenson districts. Visiting directors saw results of beautification efforts in five townships and have included rural beautification in their own programs this year.

Directors of the Menominee County District are confident that their program, which started with the "fringe benefits" of good soil and water conservation practices, will continue. The resulting benefit will have a lasting effect on a region of which they are justifiably proud. ♦

Standard soil conservation practices, such as this improved pasture, and beef herd on the Vincent Peterson farm, contribute to rural beautification.

Catfish farmers of America recently organized

A new society, the Catfish Farmers of America, has just recently been organized.

The officers of the society consist of Charles W. Pickering, president, Laurel, Miss.; Tom Pugh, vice president, Portland, Ark.; and Kenneth Coon, secretary, Tuckerman, Ark. There are also 11 directors from seven Southern States (Miss., La., Okla., Ark., Ga., Tenn., and Tex.) ♦

Laws and the public lands

By Ed Kerr

Information officer, Public Land Law Review Commission, Washington, D. C.

The 88th Congress in September of 1964 established the Public Land Law Review Commission and charged it to recommend a national public land policy for the future, after studying the whole gamut of public land uses and their relations with one another. Considering that the public lands cover one-third of the Nation's land area, such a study is momentous.

Some 2,700 public land laws are in effect today, some of which date back to 1790. It is possible that some of these statutes no longer serve the best interest of the Nation. They may be out-moded or in conflict with each other, or both.

It is the purpose of the commission to determine which statutes are obsolete or conflicting.

Some of the homestead laws, for instance, date back to 1862 when the population of the United States was less than one-sixth of today's total. The basic mining law of the Nation was enacted in 1872, and the reclamation act was passed in 1902.

Further complicating the problem is the fact that responsibility for administration of the public lands is divided among many agencies which have different regulations for the management of the same resources. The commission will inquire whether the original intent of Congress is being followed in each case.

A look to the future

With one major exception, all laws covering the public domain—those public lands not dedicated to a specific use, such as National Forests—are concerned only with disposal procedures. The only exception is the Taylor Grazing Act of 1934, which authorizes the creation of grazing districts in the western states, pending final disposal. The commission will study the problem of which parts of the public domain should be retained and managed for various uses in the foreseeable future.

Congress charged the commission with four main responsibilities: (1) Review the Federal public land laws; (2) review all the regulations, practices, and policies stemming from those laws; (3) determine the various demands on the public lands which now exist and which are likely to exist within the foreseeable future; and (4) recommend whatever modifications are necessary to enable the public lands to serve the maximum benefit for the general public. These recommendations must be submitted to Congress and to the President of the United States by June 30, 1970.

Membership of the commission

Unlike past groups created to study the public lands, the commission has members from both houses of Congress as well as Presidential appointees—six members appointed by the Speaker of the House, six by the President of the Senate, and six non-Federal members appointed by the President of the United States.

The 19th member was elected by the 18 appointees and serves as chairman. He is Representative Wayne N. Aspinall of Colorado. Vice chairman is H. Byron Mock, a Presidential appointee who is an attorney in Salt Lake City, Utah. Milton A. Pearl is staff director.

In addition, the act provides for an advisory council, which has 33 members, and for representatives of the 50 state governors to assist the commission.

Eight of the advisory council members are representatives of those Federal departments and agencies chiefly concerned with the public lands and public land policy. The other 25 represent various groups interested in public land problems, including the following fields: state and local government, public land management, outdoor recreation resources and opportunities, landowners, forestry, livestock, mining, oil and gas, fishing, commercial outdoor recreation, industry, education, labor, and public utilities.

Special studies

According to Director Pearl, the study program will encompass 34 studies and analyses, as follows:

(1) History of Public Land Law Development. This is being compiled by Dr. Paul Wallace Gates, professor of history at Cornell University.

(2) Revenue Sharing and Payments in Lieu of Taxes on Federal Public Lands. Contractor is EBS Management Consultants, Inc., of New York and Washington, D. C. Study report was submitted on May 15, 1968.

(3) Digest of Public Land Laws. This has been prepared by Shepard's Citations, Inc., of Colorado Springs, Colo. It is for sale by the Superintendent of Documents.

(4) Forage. Contractor is the University of Idaho. Study report is due in March 1969.

(5) Administrative Rule-Making and Adjudication Procedures of Federal Public Land Management Agencies. Contractor is the University of Virginia. The study is to be completed by November 30, 1968. This will include agency procedures in making regulations, initial adjudication of rights and privileges, and judicial review of administrative decisions.

(6) Land Exchanges and Acquisitions.

(7) Withdrawals and Reserva-

tions. Contractor is Charles F. Wheatley, Jr., practicing attorney of Washington, D. C. Study report has been submitted.

(8) Federal Public Land Laws and Policies in Alaska. Contract has been awarded to University of Wisconsin. Study report is due December 31, 1968.

(9) Future National and Regional Demands for Commodities Producible on the Public Lands. Contractor is Robert R. Nathan Associates, Inc., of Washington, D. C. Study report has been submitted.

(10) Timber. Study contracted to George Banzhaf and Company of Milwaukee, Wis. Report is due March 31, 1969.

(11) Nonfuel Minerals. Legal segment of this study has been contracted to Twitty, Sievwright and Mills, law firm of Phoenix, Ariz., and will be completed by March 31, 1969. The resources segment will be handled under a separate contract.

(12) Energy Fuels. This study has been divided into four parts: (1) Coal (legal); oil shale (legal); oil and gas leasing systems (legal); and fuel resources. The legal study of coal has been contracted to the University of Utah, with a reporting date set for November 30, 1968. The oil shale study, contracted to the University of Denver College of Law, is due February 28, 1969. The fuel resources study is in final draft stage. The study of oil and gas leasing systems, contracted to Rocky Mountain Mineral Law Foundation, is due February 28, 1969.

(13) Water. This was contracted to Charles F. Wheatley, Jr., of Washington, D. C., and Professor Charles E. Corker of the University of Washington School of Law. The study report is due November 30, 1968.

(14) Regional and Local Land Use Planning. Contractor is Herman D. Ruth and Associates of Berkeley, Calif. Study report is due March 31, 1969.

(15) Outdoor Recreation.

(16) Land Grants to States. This will be an in-house study.

(17) Criteria for Judging Facts to Determine what Constitutes "Maximum Benefit for the General Public."

(18) Use and Occupancy of Public Lands.

(19) Fish and Wildlife. Contractor is Colorado State University. Report is due in December 1968.

(20) Intensive Agriculture. Contractor is South Dakota State University. Study report is due March 31, 1969.

(21) Outer Continental Shelf. Contractor is the Los Angeles law firm of Nossaman, Waters, Scott, Krueger and Riordan. The report has been submitted.

(22) Organization, Administration, and Budgeting.

(23) Impact of Public Ownership on Local and Regional Economies.

(24) Noneconomic Aspects and Implications of Public Land Ownership in Local and Regional Areas.

(25) User Fees and Charges.

(26) Techniques and Procedures in Disposing of Federal Lands or Interests in Land.

(27) Adjustment of Use Rights to Achieve Federal Land Management Objectives.

(28) Multiple Use—Advantages and Disadvantages.

(29) Impact of Federal Jurisdiction on Federal Public Land Areas.

(30) Inventory of Public Lands and Resources.

(31) Environmental and Ecological Factors Involved in Public Land Management.

(32) Appraisal Techniques and Procedures.

(33) Trespass.

(34) State Land Policies. ♦

Woodland conservation

SCS technicians play an important role in getting woodland conservation on the land by assisting landowners in developing soil and water conservation plans. ♦

Gravel mulch used to raise water table

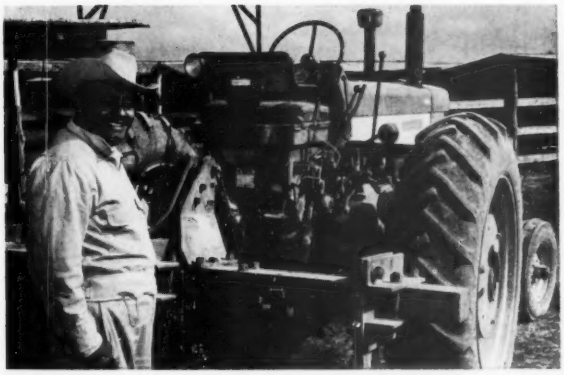
Irrigation farms in parts of the Midwest are pumping more water out of the ground than annual rainfall can restore, USDA's Agricultural Research Service reports. Gravel mulching can help replenish ground water in some areas. A layer of sand or gravel spread on low-value land will catch precipitation, keep most of it from evaporating, and speed it down to the water table, experiments conducted by the Colorado State University show. Dr. William D. Kemper, soil scientist employed jointly by ARS and the university, estimates that gravel mulches could put 10 to 12 additional inches of rainfall each year into the water table.

But some problems still need to be solved. Gravel-mulched areas should be kept weed free, and studies need to be conducted to make sure weedkillers don't contaminate the ground water.

Research is now underway at the University of Arizona on a machine that will extract gravel from gravelly soils and spread it on the surface. On soils averaging at least 20 percent gravel, the cost of the machine operation would be $10–$20 an acre—not unreasonable, Dr. Kemper says, considering the yields that can be obtained with irrigation. ♦

Irrigation measures for water management

Irrigation measures may include water-supply reservoirs, diversion dams, pumping plants, sluiceways, canal headworks, canal laterals, and main distribution pipelines to carry water to the farm boundary. They also may include lining canals and sealing storage reservoirs, and measures needed to conserve and use water supplies efficiently and to convey water with the least practical loss. ♦



Rio Grande farmer succeeds with conservation farming

F. P. Gonzalez uses the modern equipment on the left but remembers how he developed some of the first irrigated land in the Lower Rio Grande Valley with the mule-drawn equipment on the right. Below, Mr. and Mrs. Gonzalez now live in this modern brick home next door to the farm where he once worked for $0.50 a day.

F. P. Gonzalez of Hidalgo, Tex., has seen a lot of changes since he followed the mule teams on the banks of the Rio Grande from sunup to sundown for $0.50 a day. Now he operates tractor powered equipment on his own 234-acre irrigated farm.

Gonzalez was born of Mexican parents near Hidalgo. When he was in his teens, he worked on the Joe Pate Ranch across the International bridge from Reynosa, Mexico. Here, Gonzalez learned farming and cattle raising. When he was able to buy a team and some equipment he began to farm "on shares" for Joe Pate. Later, he started buying his own land and today part of Gonzalez's farm joins the old Pate ranch.

Mr. Gonzalez began land leveling with mule-drawn equipment in 1952, when he began to apply a conservation plan as a cooperator with the Southmost Soil and Water Conservation District. Now permanent practices are applied, and all but 12 acres of his land is leveled.

Besides his principal measures of land leveling and irrigation pipelines, Gonzalez has carried out a good conservation cropping system. He uses high tonnage sorghum crops for soil improvement in rotation with cotton and vegetables. All residues from his grain crops are shredded and left on, or near, the soil surface. He also carries out a good fertilization program using fertilizer according to soil tests.

Following three major surgical operations, recently, Gonzalez thought the big farm might be too much for him to handle. He has rented all but 18 acres until his son Oscar returns from Vietnam to help with the farming. "Life has its pitfalls, but it also has its rewards if you work hard," Mr. Gonzalez believes.—ROBERT W. WILLIAMS, *work unit conservationist, SCS, Edinburg, Tex.* ♦

Pasture is put to maximum use with full-season grazing

A conservation plan including provision for producing year-round forage enables Fred Felder, a Pike County Soil Conservation District cooperator near Macomb, Miss., to get more grazing from his pastures without exceeding the land's capability.

This year, Felder is putting a hundred cows on 150 acres. This is one cow to 1½ acres, double the traditional ratio in this area of 1 to 3 acres.

With technical assistance from the Soil Conservation Service, Mr. Felder developed a plan to fertilize and manage his pastures so they will carry this increase with very little additional cost per head.

His summer pasture includes 30 acres of bahiagrass plus 60 acres of grass mixed with crimson clover. For winter grazing, he will use 60 acres of fescue.

He will apply 400 pounds of fertilizer to the 30 acres of bahiagrass for summer grazing and 500 pounds of ammonium nitrate per acre to the fescue for winter grazing.

Felder describes his rotation grazing system thus:

"Starting December 1, the cows will graze the fescue for 2 months. Then I'll move them into the crimson clover. When the cows graze that down, they'll go back on fescue.

"During March, I'll rotate between fescue and crimson.

"During April the fescue will be grazed exclusively.

"In May I'll start summer grazing on the 30 acres of bahiagrass. After the crimson clover seed are harvested, I'll start summer rotation grazing on all 90 acres of bahiagrass.

"In the late summer I'll concentrate grazing on the 60 acres of bahiagrass-crimson clover to get the surplus grass off, so the clover seed will germinate. During this time the 30 acres of bahiagrass will be growing for frosted grazing.

"At frost time I'll turn the cattle back on this 30 acres and give them a little supplementary feeding."

Fertilizer will be applied before and between grazing periods.

A good many eyes are on Fred Felder. The question is: "Can he carry a cow on an acre and a half?"

People who know him believe he can do it.

R. W. McKay, SCS work unit conservationist, Magnolia, helped Mr. Felder develop the conservation plan. Besides the grazing system, it includes 20-foot wide firelanes to divide a 300-acre timber block into 40-acre plots. The firelanes, planted with fescue, provide roads for timber harvest, as well as winter and early spring grazing.

A good program of woodland management permits native grasses to grow in the woods where the cows can do a little browsing as they graze the fescue firelanes.—HERMAN S. SAUCIER, *conservation agronomist, SCS Jackson, Miss.* ◆

Fred Felder (left) and R. W. McKay, SCS, look over one of the bahiagrass-clover pastures to be used in rotation with fescue under high fertilization and management for year-round grazing.

Hot irrigation well supports recreation

When D. O. Bybee drilled for water near Grand View, Idaho, he knew this well could do more than irrigate 40 acres of desert-land.

It was an artesian well that produced 1,260 gallons a minute at a constant temperature of 140° F. In addition, there was a separate vein of cold water that could be mixed to give any temperature desired.

Mr. and Mrs. Bybee traded for 320 acres in southwestern Idaho in 1958. They have since built a recreation enterprise that includes a 30- by 60-foot heated swimming pool, modern bath houses, picnic tables, fireplaces, motel rooms, a stable and training track for race horses, and many other facilities.

At the same time, Bybee has used technical help from the Soil Conservation Service and some finan-

cial help from the Agricultural Stabilization and Conservation Service to expand this irrigation system.

"I sure moved a lot of dirt two or three times before I learned to obtain a good engineering design instead of leveling by guess," said Bybee.

He has leveled the sandy soils on about 300 acres on this and another farm that he leased to his son and son-in-law. In addition, he has installed 3,000 feet of concrete-lined ditch and 4,000 feet of concrete pipeline as a starter on his conservation plan.

Other improvements include four irrigation reservoirs, four pumping plants, two sprinkler systems, two surface irrigation systems, and about 10 miles of irrigation canals and field ditches.

Bybee uses a conservation-cropping system that relies heavily on alfalfa.

In 1959 he was able to irrigate only a 40-acre field. Now, with these land improvements and water-conservation practices, he irrigates about 140 acres with the same amount of water.

The hot water is used to heat the swimming pool and other facilities which help cool the water for irrigation. Bybee can also flood the softball field before using the water for irrigation in the summer or he can leave it as an ice skating rink in the winter.

Another hot artesian well, located ½ mile east of the swimming pool, has a temperature of 180°. This well now heats three homes and will be used to heat a large greenhouse. Bybee plans to raise hot house tomatoes on a commercial scale.

Bybee believes in the multiple use of natural resources and claims that he has only scratched the surface on this idea. By this time, he may be planning another use for his hot mineral water.—KEN ROGERS, *work unit conservationist, SCS, Grand View, Idaho.* ♦

Water management is key to good irrigation

Plastic spiles are used to take water out of the concrete-lined irrigation ditch. C. W. McCart (at right) and Earl Markley, SCS engineering technician, study the field together.

A cooperator with Colorado's Delta Soil Conservation District, C. W. McCart, believes that conservation work done on his farm will add $900 to $1,000 to his yearly income.

McCart overcame serious ditch erosion and other land and water problems in carrying out his conservation plan, which included extensive land leveling and ditch-lining work. Some irrigation ditches had eroded to 8 feet deep and 6 feet wide because of improper location and steep grades, making it difficult to divert water onto the fields.

So far he has leveled 54 acres and has lined 2,100 feet of ditches. About 1,300 feet of lining remains to be done. The Soil Conservation Service technicians designed the leveling and lining, and McCart did the leveling work with equipment rented from the conservation district.

McCart says that using a landplane for 2 years following a leveling job keeps the field surface in good condition and remedies unevenness in the finished grade. As another followup practice to the leveling, he applied 10 to 15 tons of barnyard manure to the cut.

"I figure I can irrigate a fourth more rows with the same amount of water," McCart said.

Mr. McCart listed five major benefits from his conservation plan: (1) Three head ditches eliminated, (2) weed control no longer a problem on ditch banks, (3) 275 point rows eliminated, (4) a tremendous saving of labor in coaxing water onto the field, and (5) seepage losses cut to a bare minimum.—RICHARD R. FRANKLIN, *work unit conservationist, SCS, Delta, Colo.* ♦

District supervisors meet in air to observe progress

Supervisors of the East Carroll-Madison Soil and Water Conservation District, La., held their April meeting in a unique way. The supervisors were airborne 1½ hours while holding their board meeting so that they could fully appreciate the beauty and accomplishments in their district. ♦

My private prairie

By Rex R. Gogerty

An Iowa farmer tells why he refuses to plow a 3-acre patch of virgin prairies:

My 3-acre piece of history could have been broken up years ago. Somehow, though, the Gogerty family has resisted the temptation to turn our plot of virgin prairie into just another 3 acres of cropland. Granddad plowed around it because of a couple of wet spots. In later years, the acreage acquired a kind of unwritten immunity from the plow. Since then it has become a sanctuary for adults and kids fascinated by undisturbed nature, for wildlife and for hunters.

A string of tile and a sharp plow could help this kind of land produce whopping yields. But once the unkempt, flower-spattered prairie is plowed under, there's no turning back. So far, we've been more sentimental than sensible.

It's easy to get sentimental about the un-retouched nature that carpeted three-quarters of the Corn Belt when Indian tepees were in style. The buffalo and Conestoga wagons are long gone, but school kids claim these mounds are sure-enough Indian graves, and old-timers still reckon the prairie grass is belly deep on a respectable cow pony.

It seems there's more than sentimental value to the few patches of virgin prairie left in this country. Dr. R. W. Pohl and his colleagues in Iowa State University's botany department have identified more than 60 different kinds of flowers and grasses that grow only on unplowed prairie. You won't find them in a creek meadow or timber pasture.

"Outside of a few State-owned prairies, these plants and grasses have survived only in scattered areas along railroad rights-of-way and country graveyards," says Dr. Pohl. "This undisturbed soil also holds many chemical and entomological secrets." Scientists view native prairie as a standard by which they can measure how much modern agriculture is changing original Corn-Belt soils.

Virgin prairie is not spectacular from a distance. Like a fine painting or grandmother's crocheting, it has to be studied and touched to be appreciated. The coarse grass has an odor midway between sweet and musty, and the feel of elegant carpet under your feet. In July, the wild aster, blazing star, yellow coneflower, and dozens more lend a colorful but haphazard pattern to the lush landscape. This panorama is a refreshing end-row oasis.

I pasture that corner of the north eighty occasionally; I've even cut it for hay a few times. I realize it's pretty shaky management to let what could be corn ground escape the plow, but there's more than one way to measure the good produced by land.

As one old-timer told me as he looked across my private prairie haloed in a summer sunset: "It took the Lord a thousand years to raise that crop; no use getting in a hurry to tear it up."—*The Furrow*, April 1968. ♦

USDA grants for India irrigation research

Research on surface irrigation will be conducted by scientists in India under grants paid for by USDA in Indian rupees obtained through sales of farm products to India under Public Law 480.

Under a 5-year grant, the Indian Institute of Technology at Kharagpur will study the relation between water movement and efficiency of surface methods of irrigation.

Using both model and field tests, Indian scientists will define various rates of waterflow and soil intake, slope, and soil textures and correlate these variables with the rate of total irrigation flow. ♦

And the trails finally go somewhere

Three bridges to cross meandering streams have made a much-needed conservation education area and nature trail a reality in the rapidly growing college town of Amherst, Mass.

Supervisors of the Hampshire Conservation District stepped in to help when the Amherst Conservation Commission found itself short of funds after developing an outdoor conservation area to preserve examples of "wild land."

The nature trails had been laid out and youth groups and interested citizens had assisted in developing them. But, the commission found the trails were "all dressed up with no place to go" because three bridges were needed to cross the streams.

The Hampshire District obtained a grant of $2,500 for the bridge construction through funds made available by the Massachusetts State Committee for the Conservation of Soil, Water, and Related Resources.

In the fall of 1967, a formal ceremony was held to dedicate the bridges and conservation area. Town selectmen, conservation commissioners, Hampshire District supervisors, and members of the state committee were in attendance. They all looked on as a bright-eyed, fifth-grader cut the ribbon to officially open this new resource for the people of Amherst.

The trails finally went somewhere.—VERNON E. JOHNSON, *work unit conservationist, SCS, Northampton, Mass.* ♦

Small watershed projects

Small watershed projects have come to mean protecting, managing, improving, and developing the water and related land resources of a watershed up to 250,000 acres in size through a project-type undertaking.

Meetings . . .

Forest Soils Conference to review research

The Third North American Forest Soils Conference will be held August 5-10 at Raleigh, N. C. under the sponsorship of the Department of Soil Science and School of Forest Resources of North Carolina State University, Soil Science Society of America, Society of American Foresters, Canadian Institute of Forestry, and the Canadian Soil Science Society.

Purpose of the conference is to bring together research scientists and practicing foresters who are concerned with a knowledge of soils and soil-vegetation relationships to review and discuss recent research contributions in forest soils, soil classification and surveys, and the use and application of soils information in various phases of forest land management.

L. F. Kalmar, general manager, Continental Can Co., will deliver the keynote address on "Forest Soils from an Industrial Overview."

At the end of the meeting field trips will be conducted to observe soils and vegetation in the Upper Coastal Plain and Sandhills.

Plains Council consults on water, farm programs

The Great Plains Council at its annual meeting August 1-2, in Denver, Colo., will consider a basic theme in three sections: Water Resources, Farm Programs, and Topics of Importance in the Plains.

Among the many speakers in the Water Resources Section will be Harry Steele, assistant director for planning, Water Resources Council, Washington, D. C., and Victor L. Hauser, research agricultural engineer, Agricultural Research Service, Bushland, Tex.

Horace Godfrey, administrator of the Agricultural Stabilization and Conservation Service, Washington, D. C., and Charles McDougal, assistant administrator, Federal Extension Service, Washington, D. C., will discuss farm programs.

One of the several speakers in the section on Topics of Importance in the Plains will be Dr. J. C. Evans, director of Community and Industrial Progress, Oklahoma State University, Stillwater, Okla.

Conservation Society on resources and environment

"Creative Conservation for Life and Living" will be the theme at the annual meeting of the Soil Conservation Society of America to be held on August 18-21 in Athens, Ga.

Among the speakers are Jack W. Carlson, Council of Economic Advisors, Executive Office of the President, Washington, D. C.; Ralph R. Widner, executive director, Appalachian Regional Commission, Washington, D. C., and Raymond F. Dasman, director of Environmental Studies, Conservation Foundation, Washington, D. C.

The meeting will wind up with a choice of tours to Marbury Creek watershed, Southern Piedmont Conservation Research Center, poultry production in northeast Georgia, and forestry.

Dates and places

August 1–2, Great Plains Agricultural Council, Denver, Colo.
5–10, Third North American Forest Soils Conference, Raleigh, N. C.
18–21, Soil Conservation Society of America, Athens, Ga.
18–22, The Conservation Education Association, Colorado Springs, Colo.

September
3–7, American Institute of Biological Science, Columbus, Ohio.
11–13, International Association of Game, Fish and Conservation Commissioners, Tuscon, Ariz.
22–25, Farm and Industrial Equipment Institute, Boston, Mass.
22–27, National Conference on State Parks, Hot Springs, Ark.
23–27, Urban Land Institute, Denver, Colo.
28–October 3, American Institute of Planners, Pittsburgh, Pa.
29–October 2, American Bankers Association, Chicago, Ill.
30–October 3, Society of American Foresters, Philadelphia, Pa.

Review

World Without Hunger. By Orville L. Freeman. *1968. Frederick A. Praeger, New York. 190 pp. $5.95.*

The Secretary of Agriculture briskly and briefly states his credo and program for a world without hunger.

His book clearly states the current situation in world food production patterns and world population pressures. He tells of the role that American agriculture has played in recent years through Public Law 480 and the Food For Freedom program.

He explores the difficulties that must still be overcome in world agricultural development, as well as the achievements that have been made where there is determination to succeed, and he looks at the use of capital and credits by governments, the place of private investment, and the record of voluntary agencies, foundations, international bodies, and cooperating American executive agencies, such as AID and the Peace Corps.

"This book seeks to explore," he says, "what you and I can do as individuals and what our nation and other nations must do as governments to free mankind from the threat of famine. It is written out of my conviction that, if all peoples work together, nightmares of starvation can be forgotten and we can realize the age-old, sweet dream of a world without hunger."—B.O.

Prairie Plants and Their Environment. By J. E. Weaver. *1968. Univ. of Nebr. Press, Lincoln. 276 pp., illus. $6.95.*

This book is the last chapter in the late Dr. J. E. Weaver's lifelong study of the prairies, the full story of which is told in 104 scientific publications of which he was author or co-author.

Weaver was in his early eighties when he wrote this book. It does not pretend to encompass new studies. Rather, it assembles under one cover the highlights of his work and that of many of his graduate students.

Dr. Weaver was always impatient of students whose eyes stopped at ground level, who failed to visualize each nook and cranny of the soil in which roots could conceivably be found. It is not surprising, therefore, that three of 14 chapters deal specifically with the nature of prairie plant roots and the soils in which they grow.

For almost 60 years a spade and an ice pick (for working soil away from roots) were the major items in Dr. Weaver's field kit. In one 4-year study alone, 150 trenches, each 2.5 feet wide, 5 to 10 feet long, and 5 to 15 feet deep were used to study 1,500 root systems in various kinds of soil.

In addition to the three chapters on roots and soils, four chapters deal with the floristic and ecological nature of the prairie, three are concerned with the effects of grazing, three with drought, and one with woodlands adjacent to prairies.

A liberal array of meticulous drawings and excellent photographs illustrate the text. Also included is a complete list of Dr. Weaver's publications plus doctoral theses by some of his students that further describe the nature of prairies.

This condensation of a number of detailed studies and publications will be of interest and value to students, workers, and laymen with some affinity for prairies and plains. —ARNOLD HEERWAGEN, *range conservationist, Regional Technical Service Center, SCS, Lincoln, Nebr.*

New publications

Site Selection and Development: Camps—Conferences—Retreats. *1965. United Church Press, Philadelphia, Pa. 19102. 174 pp., illus.* Prepared by the Committee on Camps and Conferences of the National Council of the Churches of Christ. This handsome spiral-bound book shows the imprint of the professional architects, engineers, designers, and planning consultants who contributed to its production. Although it describes facilities for activities of "the church in the outdoors," the principles and many of the specifics are equally useful for other types of recreation, camp, and conference installations.

Manual of Septic-Tank Practice. *Rev. 1967. U. S. Dept. Health, Education, and Welfare. Public Health Service Publ. 526. 92 pp., illus.* An updating of a manual first published in 1957 to reflect changing trends in the problems of individual sewage disposal systems and including new data on the design, installation, and maintenance of septic tanks. William G. Shannon, Engineering Division, Washington, D. C., was the Soil Conservation Service representative on the Joint Committee on Rural Sanitation that served in an advisory capacity in revising the publication.

Resource Conservation and Development Projects. *Rev. 1968. SCS-CI-14. 4 pp., illus.* Facts on RC&D projects initiated by local people that involve more than one county and include all interests in the area—rural, suburban, and urban—for the purpose of developing natural and related resources.

Room to Roam. *1968. U. S. Dept. Interior, Bur. of Land Management. 32 pp., illus. $0.50.* A beautifully illustrated publication in color, it is a recreation guide to public lands that lie mostly in the Western States and Alaska. Numerous points of interest are listed by regions—the Rockies, the Southwest, the Great Plains, the Great Basin, the Northwest, southern and central California, and Alaska—all keyed to large colored documented maps throughout the text.

Soil Conservation Districts. *Rev. 1968. USDA PA-417, 8 pp., illus.* Tells what they are, how they work, and how SCS helps them.

Farm Real Estate Market Developments. *1968. USDA Economic Research Service CD-70. 46 pp., charts.*

Soil surveys

Harrison County, Kentucky. BY HUBERT B. ODOR, BILLY C. WEISENBERGER, ROBERT L. BLEVINS, AND JOHN L. TAYLOR. *1968. 58 pp., illus; maps 4 inches to the mile (1:15,840).*

Walthall County, Mississippi. BY ALBERT R. LEGGETT, ALLEN C. MILBRANDT, L. BROOKS HALE, AND PAUL J. BARLOW. *1968. 76 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

AMERICA THE BEAUTIFUL LITHOGRAPHS

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Full-color lithograph prints suitable for framing—one for each state, Puerto Rico, and Virgin Islands—are available from the Superintendent of Documents for $0.10 each or $5 for set of 52. Obtain order blanks from your local SCS or post office.

From the Administrator:

Greater Benefits From Our Forest Lands

One of the seven major objectives of USDA's program of Resources in Action/Agriculture 2000, defined recently by the Secretary of Agriculture, is "Obtaining greater benefits from our forest lands."

Whole rural communities depend for their existence and strength on forest land and its products—for timber and wood products, for environmental protection, for recreational and esthetic purposes, for water supply, and for grazing and browsing by domestic stock and wildlife.

The production of timber on land owned by farmers and other private owners is of key importance in the United States, particularly in the East. Encouraging the further development of viable farm woodland enterprises, particularly in areas of substandard income and low opportunity, can help meet timber needs and at the same time bring about an economic and social change for the better in rural America.

All over the Nation are small landowners who, once barely able to keep their farm enterprises going, are now investing in farm improvements, equipment, and household appliances and other amenities they had not enjoyed previously. Many owe this economic gain to the addition or improvement of woodland products as a crop.

Planning a woodland by landowners for sustained performance as part of a balanced farm operation, as a commercial wood-crop enterprise, or as a recreational retreat, is a complex procedure. It involves matching the physical resources of the tract to the economic and personal circumstances and desires of the owner and operator.

It is at this point of fitting the operator's land use pattern and management goals to the physical features of his land resources that the Soil Conservation Service can make its major contribution to woodland resources development. Information from the soil survey, interpreted in terms of woodland potentials, is an invaluable source of guidance at the crucial planning stage.

The Soil Conservation Service has a concern with conservation on woodlands, not as a separate activity served by a separate corps of technicians but as a part of the total soil and water conservation program for any tract of privately owned land.

In helping a landowner develop a conservation plan for his land, SCS soil conservationists can help him consider and evaluate the feasible alternatives as affected by information about the soils he has to work with.

Finding the relationships between soils and trees is a "team" job. Foresters and soil scientists work together to locate suitable study sites, to describe soils and measure tree growth, and to analyze results. This involves many people and many agencies. Few studies are made solely by the Soil Conservation Service. State forestry agencies generally assist by making and recording the tree measurements. Colleges of forestry and representatives of industry help to ascertain soil-tree relationships.

Basic forest soil research by the Forest Service, colleges, and industry is essential to determining these correlations. Improved understanding of the relations of trees to the many variables in soil, resulting in improved management techniques, has emerged from this basic research. This, in turn, has improved the efficiency of mapping forest soils. SCS work is based on such research and continues to be improved by it.

Forest industries with large holdings are potentially the most intensive users of forest soils information. Some industries employ soil scientists to map their own soils. Most, however, depend on the SCS and the soil survey for soil information needed in planning woodland operations.

To make our soil information more useful, SCS has developed a national system of classifying soils as to their suitability for woodland use and management. It gives us for woodland what we have had for many years for cropland in our land-capability classification.

Woodland interpretations are predictions of growth and behavior of trees on specific soils. They indicate soil-related capabilities, hazards, and limitations affecting tree crops and the use of forest land for multiple purposes.

The most numerous users of soil survey information are owners of smaller woodland tracts. A majority of them are cooperators with one of the more than 3,000 local conservation districts, which are in position to help the landowner get assistance from many sources. Some districts have equipment and facilities of their own for the use of cooperators to put their plans into effect.

More of the Nation's farmland is in trees than in any other crop except grass. There is a challenge and an opportunity to put that valuable resource to work to increase the strength and stability of rural America. The soil survey with woodland interpretations and other special evaluations of soils, helps the planner and manager to use these precious resources wisely.

D. A. Williams

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A do-it-yourself conservation tour guide

A guide to enable teachers taking classes on field trips find examples of conservation on the land is proving to be a popular teaching aid in Manitowoc County, Wis.

It is an equally popular tour-aid for individuals who simply want to see things for themselves.

The 140-page fully illustrated booklet was published jointly by Conservation Education, Inc., of Manitowoc County and the Manitowoc County Soil and Water Conservation District. Conservation Education, Inc., is a private organization funded by local contributions.

The guide, entitled *Manitowoc County Outdoors,* contains illustrations and explanatory comment for hundreds of sites having conservation, historical, or geographical interest. It also explains how the natural resources have influenced the economic development and welfare of the county. A special 10-page section briefly relates the geological history of the Lake Michigan shoreline and promotes understanding the county's present geography.

A large map at the back of the guide locates each site and identifies it by a number. Sites are indexed and cross referenced by resources emphasized at each, enabling the user to plan for tours or individual site visitation to suit his interests.

Most sites are illustrated by aerial photos on which symbols and terms have been placed to show locations of specific conservation measures. The sites may be hiked over by permission of the owner. Many can be viewed from observation stops on the highway.

An attractive booklet with chrome-color cover invites youths, adults, and "Sunday travelers" into the Manitowoc County countryside. (Photo courtesy of Conservation Education, Inc.)

Nearly all sites involving applied conservation measures are on the land of Manitowoc County Soil and Water Conservation District cooperators. Each cooperator feels proud and honored to be a part of the county's conservation education program.

A narrative introduction for each major resource subject area and the glossary provide information for use in discussion and observation of the site.

Manitowoc County Outdoors, released in 1967, is the product of several years of cooperative effort on the part of an editing committee consisting of conservation technicians, educators, individuals, and organizations interested in better conservation education. For years the conservationists have been ardently sought after to visit classrooms and individual groups to tell about resources and the need to properly manage them. These visitations were time consuming for the conservationists, and still there were many who were not reached.

It became evident that professional conservationists needed to concentrate on teacher and leader development and on assisting with conservation field days involving hundreds of students at a time. The stage was reached long ago where teachers and leaders should assume the role of pretrip preparation and posttrip followup. Now, with the outdoor guide, they can conduct their own field trips.

When the local people in Manitowoc County request assistance in conservation education—they get it!—NORMAN E. SCHMEICHEL AND DONALD W. NIENDORF, *work unit conservationist, SCS, and conservation education specialist, State Soil Conservation Board, Manitowoc, Wis.* ♦